What is claimed is:

1. A dispersion monitoring device for monitoring a dispersion characteristic of an optical communication system, comprising:

a data flip-flop determining whether an input signal is at a high level or a low level by inputting a received signal obtained by optically/electrically converting optical signal transmitted through the optical communication system and setting a decision phase and a decision threshold, and outputting the result of decision as a logical value;

an integration circuit averaging logical values outputted from the data flip-flop; and

a dispersion detection unit detecting a change in dispersion caused in the optical communication system.

2. The dispersion monitoring device according to claim 1, comprising:

a plurality of the data flip-flops at least one of the decision phase and decision threshold of which is set differently from each other; and

a plurality of integration circuits corresponding to the plurality of data flip-flops,

wherein

said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit.

3. The dispersion monitoring device according to claim 1, comprising:

a threshold control unit changing and controlling a decision threshold set by the data flip-flop,

wherein

said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit.

4. The dispersion monitoring device according to claim 1, comprising:

a phase control unit changing and controlling a decision phase set by the data flip-flop,

wherein

said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit in correspondence with each different decision phase.

5. The dispersion monitoring device according to claim 1, wherein

said dispersion detection unit detects a change in chromatic dispersion caused in the optical communication system.

6. The dispersion monitoring device according to claim 1, wherein

said dispersion detection unit detects a change in polarization mode dispersion caused in the optical communication system.

7. A dispersion monitoring method for monitoring a dispersion characteristic of an optical communication system, comprising:

performing a decision process of a received waveform of optical signal transmitted through the optical communication system, using a data flip-flop determining whether an input signal is at a high level or a low level by inputting a received signal obtained by optically/electrically converting optical signal transmitted through the optical communication system;

averaging logical values outputted from the data flip-flop by an integration circuit; and detecting a

change in dispersion caused in the optical communication system, based on a change in a level of a signal outputted from the integration circuit.

8. The dispersion monitoring method according to claim 7, wherein

said decision process using said data flip-flop is performed for a plurality of different decision thresholds.

9. The dispersion monitoring method according to claim 7, wherein

said decision process using said data flip-flop is performed for a plurality of different decision phases.

10. An automatic dispersion compensating system using the dispersion monitoring device according to claim 1, comprising:

a variable dispersion compensator disposed in a transmission line; and

a control circuit automatically compensating for dispersion caused in optical signal transmitted through the transmission line, by feedback-controlling an amount of compensation in the variable dispersion compensator so as to reduce the change, based on a change in dispersion

detected by the dispersion monitoring device disposed on a receiving side before the variable dispersion compensator.

11. The automatic dispersion compensating system according to claim 10, wherein

said variable dispersion compensator is disposed at a receiving end of the transmission line.

12. The automatic dispersion compensating system according to claim 10, wherein

said variable dispersion compensator is disposed at a transmitting end of the transmission line.

13. The automatic dispersion compensating system according to claim 10, wherein

said variable dispersion compensator is disposed within a repeater span of the transmission line.

14. The automatic dispersion compensating system according to claim 10, wherein

when a wavelength-division multiplexing optical signal including a plurality of waves of channel light each with a different wavelength is transmitted through the transmission line, said dispersion monitoring device

is provided in correspondence with channel light with each wavelength of the wavelength-division multiplexing optical signal.

15. The automatic dispersion compensating system according to claim 10, wherein

said control circuit executes a setting operation so that an initial value of a amount of dispersion compensation of the variable chromatic dispersion compensator can be located in a feedback-controllable range, using transmission quality information.

16. A chromatic dispersion compensation controlling system for compensating for chromatic dispersion caused when an optical signal is transmitted through a transmission line, comprising:

a peak detection unit detecting a peak value of a receiving signal; and

a control unit determining whether chromatic dispersion caused in an optical signal is excessive in a positive direction or in a negative direction, by comparing the peak value with a predetermined threshold and supplying a variable chromatic dispersion compensator with a control signal.

17. The chromatic dispersion compensation controlling system according to claim 16, further comprising:

a transmission quality detection unit detecting transmission quality information of a receiving signal, wherein

said control unit supplies the variable chromatic dispersion compensator with a control signal, using a positive/negative sign of excessive chromatic dispersion obtained by detecting a peak value and an absolute value of an amount of chromatic dispersion to be compensated that is obtained from the transmission quality information.

18. The chromatic dispersion compensation controlling system according to claim 17, wherein

said control unit sets a threshold of an amount of change in optimal chromatic dispersion compensation, and controls the chromatic dispersion compensation with high accuracy by a down-hill method or a dithering method, if an observed amount of change is equal to or less than the threshold and controls the chromatic dispersion at high speed using a positive/negative sign of residual chromatic dispersion obtained from a peak value and an absolute value of an amount of chromatic dispersion to be compensated if the amount of change exceeds the

predetermined threshold.

19. The chromatic dispersion compensation controlling system according to claim 17, wherein

said transmission quality detection unit detects an error rate of a receiving signal using an FEC function.

20. The chromatic dispersion compensation controlling system according to claim 17, wherein

said transmission quality detection unit detects an error rate of a received signal using a byte B1 of an overhead if the received signal is a SONET/SDH signal.

21. The chromatic dispersion compensation controlling system according to claim 16, wherein

said peak detection unit comprises a D flip-flop inputting data, a decision threshold and a timing-adjusted clock, and storing and outputting a result of comparing data with a decision threshold.

22. A chromatic dispersion compensation controlling method for compensating for chromatic dispersion caused when an optical signal is transmitted through a transmission line, comprising:

detecting a peak value of a receiving signal; and

determining whether chromatic dispersion caused in an optical signal is excessive in a positive direction or in a negative direction, by comparing the peak value with a predetermined threshold and supplying a variable chromatic dispersion compensator with a control signal.

23. The chromatic dispersion compensation controlling method according to claim 22, wherein

in said determining step, a control signal is supplied to said variable chromatic dispersion compensator, using a positive/negative sign of excessive chromatic dispersion obtained by a detection of a peak value and an absolute value of an amount of chromatic dispersion compensation to be compensated that is obtained from the transmission quality information.

24. The chromatic dispersion compensation controlling method according to claim 23, wherein

in said determining step, a threshold of an amount of change in optimal chromatic dispersion compensation is set, and chromatic dispersion compensation is controlled with high accuracy by a down-hill method or a dithering method, if an observed amount of change is equal to or less than the threshold, and chromatic dispersion is controlled at high speed using a

positive/negative sign of residual chromatic dispersion obtained from a peak value and an absolute value of an amount of chromatic dispersion to be compensated, if the amount of change exceeds the predetermined threshold.

25. The chromatic dispersion compensation controlling method according to claim 23, wherein

an error rate of a receiving signal is detected using an FEC function.

26. The chromatic dispersion compensation controlling method according to claim 23, wherein

an error rate of a receiving signal is detected using a byte B1 of an overhead if the receiving signal is a SONET/SDH signal.

27. The chromatic dispersion compensation controlling method according to claim 23, wherein

in said peak detection step, a D flip-flop inputting data, a decision threshold and a timing-adjusted clock, and storing and outputting a result of comparing data with a decision threshold is used.